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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/066,187	01/31/2002	Steven Teig	SPLX.P0133	5277
23349	7590	10/03/2003	EXAMINER	
STATTLER JOHANSEN & ADELI P O BOX 51860 PALO ALTO, CA 94303			TAT, BINH C	
			ART UNIT	PAPER NUMBER
			2825	

DATE MAILED: 10/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/066,187

Applicant(s)

TEIG ET AL.

Examiner

Binh C. Tat

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 18-23 is/are allowed.
- 6) ☒ Claim(s) 1-3, 6-13 and 15-17 is/are rejected.
- 7) ☒ Claim(s) 4, 5 and 14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other:

DETAILED ACTION

1. This office action is in response to application 10/066187 filed on 01/31/02.

Claims 1-23 remain pending in the application.

*Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-3, 6-13, and 15-<sup>17</sup>~~23~~ are rejected under 35 U.S.C. 102(e) as being anticipated by Dutta et al. (US Patent 6324675).
3. As to claims 1 (method) 11 (computer program embedded), Dutta et al. teach a method of specifying routes for a group of nets, the method comprising: a) specifying a total cost (see col 8 lines 30-50); b) performing a first depth-first search to identify, for the group of nets, a complete routing solution that has a cost that does not exceed the total cost, wherein a routing solution for a set of nets includes a route for each net in the set (see fig 3A-3C col 7 lines 41-67 and col 8 lines 1-67); c) if the search cannot find the complete routing solution, incrementing the total cost (Dutta teach cost computation in col 7 lines 19-27) and performing a second depth-first search to identify a complete routing solution for the group of nets that has a cost that does not exceed the incremented total cost (see fig 3A –3C and and Fig 5A-5C and col 7 lines 19-40 and col 9- 11).

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4. As to claim 2, and 12 Dutta et al. teach wherein performing a first depth-first search comprises: a) identifying a first set of routes for a first net in the group, wherein each route has a cost (see fig 3A-3C col 7 lines 41-67 and col 8 lines 1-67); b) individually examining the first-set routes until the complete routing solution is identified or until all first-set routes have been examined without identifying the complete routing solution (see fig 3A-3C col 7 lines 41-67 and col 8 lines 1-67); c) wherein individually examining a particular first-set route includes determining whether, in the region with the particular first-set route embedded, a first partial routing solution for the nets other than the first net exists such that the cost of the particular first-set route plus the first partial solution does not exceed the total cost (see fig 3A-3C col 7 lines 41-67 and col 8 lines 1-67).

5. As to claims 3 and 13 Dutta et al. teach wherein when the method determines that a first partial routing solution exists while examining a particular first-set route, identifying the particular first-set route and the routes of the first partial routing solution as the complete routing solution (see fig 3A-3C col 7 lines 41-67 and col 8 lines 1-67 and background).

6. As to claim 6 and 16 Dutta et al. teach wherein individually examining the first-set routes comprises individually examining the first-set routes Until the complete routing solution is identified or until all first-set routes have been examined without identifying the complete routing solution or a until particular number of routes have been examined (see fig 3A-3C col 7 lines 41-67 and col 8 lines 1-67 and background).

7. As to claim 7-9 and 15 Dutta et al. teach wherein the first-set routes are examined in a particular order, wherein the order is based on the cost of the routes (see fig 3A-3C col 7 lines

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41-67 and col 8 lines 1-67); and further comprising: ordering the nets before performing the depth-first search the first time (see fig 3A -3C and and Fig 5A-5C and col 7 lines 19-40 and col 9- 11 and background).

8. As to claim 10 and 17 Dutta et al. teach wherein the generated routes are topological routes(see fig 3A -3C and and Fig 5A-5C and col 7 lines 19-40 and col 9- 11 and backgruond).

*Allowable Subject Matter*

9. Claims 4-5 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance:

10. Claims 4-5, and 14 are allowed because the prior art does not teach or suggest a method of specifying routes for a group of nets, the method comprising: a) specifying a total cost; b) performing a first depth-first search to identify, for the group of nets, a complete routing solution that has a cost that does not exceed the total cost, wherein a routing solution for a set of nets includes a route for each net in the set; c) if the search cannot find the complete routing solution, incrementing the total cost and performing a second depth-first search to identify a complete routing solution for the group of nets that has a cost that does not exceed the incremented total cost; and wherein when the method determines that a first partial routing solution exists while examining a particular first-set route, identifying the particular first-set route and the routes of the first partial routing solution as the complete routing solution, and wherein determining whether a first partial routing solution exists in the region with the particular first-set route embedded comprises: a) in the region with the particular first-set route embedded, identifying a

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second set of routes for a second net in the group; b) individually examining the second-set routes until the complete routing solution is identified or until all second-set routes have been examined without identifying the complete routing solution; c) wherein individually examining a particular second-set route includes determining whether, in the region with the particular first-set route and the particular second-set route embedded, a second partial routing solution for the nets other than the first and second nets exists such that the cost of the particular first-set and second-set routes plus the second partial solution does not exceed the total cost.

The following is an examiner's statement of reasons for allowance:

*11.* Claims 18-23 are allowed because the prior art does not teach or suggest a method of routing a group of nets within a region, the method comprising: a) generating a first set of routes for a first net in the region; b) selecting a first route from the first set of routes; c) generating a second set of routes for a second net in the region when the region contains the first route; d) determining whether any of the generated second-set routes for the second net can be embedded for an acceptable cost in the region that contains the first route for the first net; e) when none of the second-set routes can be embedded for an acceptable cost in the region that contains the first route, selecting a second route from the first set of routes; generating a third set of routes for the second net in the region when the region contains the second route; and determining whether any of the generated third-set routes for the second net can be embedded in the region that contains the second route for the first net

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*Conclusion*

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Binh C. Tat whose telephone number is (703) 305-4855. The examiner can normally be reached on 7:30 - 4:00 (M-F).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mathew Smith can be reached on (703) 308-1323. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3431 for regular communications and (703) 305-3431 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

Binh Tat  
Art Unit 2825  
September 22, 2003

  
VUTHE SIEK  
PRIMARY EXAMINER